

CLAIMS

1. A method for manufacturing a component built-in module, comprising the steps of:

5 on one principal surface of a first electrical insulating sheet with a cavity formed penetrating therethrough, laminating a second electrical insulating sheet so as to cover the cavity, so that a third electrical insulating sheet comprising the first electrical insulating sheet and the second electrical insulating sheet is formed;

10 forming a via hole so as to penetrate through the third electrical insulating sheet;

filling the via hole with a conductive resin paste;

disposing a first wiring board with a first wiring pattern and an electronic component mounted on the first wiring pattern so as to face a
15 principal surface of the third electrical insulating sheet at which the cavity has been formed, and disposing a second wiring board with a second wiring pattern so as to be opposed to the first wiring board with respect to the third electrical insulating sheet;

stacking the first wiring board, the third electrical insulating sheet
20 and the second wiring board so that the electronic component is built in the cavity and the via hole is disposed between the first wiring pattern and the second wiring pattern; and

applying heat and pressure by hot pressing to the stacked first wiring board, third electrical insulating sheet and second wiring board, so that the
25 first wiring pattern and the second wiring pattern are connected electrically through a via conductor made of the conductive resin paste.

2. The method for manufacturing a component built-in module according to claim 1,

30 wherein the third electrical insulating sheet is formed by further

laminating a fourth electrical insulating sheet with a cavity formed penetrating therethrough so as to be opposed to the first electrical insulating sheet with respect to the second electrical insulating sheet,

the second wiring board disposed to be opposed to the first wiring board further comprises an electronic component mounted on the second wiring pattern, and

the first wiring board, the third electrical insulating sheet and the second wiring board are stacked so that the electronic component mounted on the second wiring pattern is built in the cavity formed in the fourth electrical insulating sheet.

3. The method for manufacturing a component built-in module according to claim 1,

wherein the second electrical insulating sheet comprises a cavity penetrating therethrough, the cavity being formed at a position that does not overlap with a position of the cavity formed in the first electrical insulating sheet;

the second wiring board disposed to be opposed to the first wiring board further comprises an electronic component mounted on the second wiring pattern, and

the first wiring board, the third electrical insulating sheet and the second wiring board are stacked so that the electronic component mounted on the second wiring pattern is built in the cavity formed in the second electrical insulating sheet.

4. The method for manufacturing a component built-in module according to claim 1,

wherein the first wiring board further comprises a supporting member with the first wiring pattern formed thereon, and

after applying heat and pressure by the hot pressing, the supporting

member is removed.

5. The method for manufacturing a component built-in module according to claim 1,

5 wherein the cavity formed in the first electrical insulating sheet comprises a first cavity and a second cavity,

the second electrical insulating sheet comprises a third cavity communicating with the second cavity,

10 the electronic component mounted on the first wiring pattern of the first wiring board comprises a first electronic component and a second electronic component whose height is larger than that of the first electronic component, and

15 the first wiring board, the third electrical insulating sheet and the second wiring board are stacked so that the first electronic component is built in the first cavity and the second electronic component is built in the second cavity and the third cavity.

6. The method for manufacturing a component built-in module according to claim 1, wherein the first electrical insulating sheet and the
20 second electrical insulating sheet comprise 70 to 95 weight% of inorganic filler and 5 to 30 weight% of uncured thermosetting resin composition.

7. The method for manufacturing a component built-in module according to claim 1, wherein a flow viscosity at 120°C of the first electrical
25 insulating sheet and the second electrical insulating sheet is 1,000 to 20,000 Pa·S.

8. The method for manufacturing a component built-in module according to claim 1, wherein the second electrical insulating sheet is
30 laminated on the first electrical insulating sheet at a temperature of 100°C or

lower and at a pressure of 1 MPa or lower.

9. The method for manufacturing a component built-in module according to claim 1, wherein after attaching a protective film to a principal surface of the third electrical insulating sheet, the via hole is formed so as to penetrate through the protective film and the third electrical insulating sheet.

10. The method for manufacturing a component built-in module according to claim 1, wherein the via hole is filled with the conductive resin paste by the steps of:

(i) disposing the conductive resin paste on a principal surface of the third electrical insulating sheet;

(ii) applying the conductive resin paste over the principal surface so that a paste layer made of the conductive resin paste with a predetermined thickness is formed around an opening of the via hole on the principal surface, while filling the via hole with the conductive resin paste; and

(iii) scraping the paste layer off from the principal surface, while filling the via hole with the conductive resin paste.

11. The method for manufacturing a component built-in module according to claim 10, wherein the paste layer is formed on the opening of the via hole and at a region within at least 300 μm from an edge of the opening.

12. The method for manufacturing a component built-in module according to claim 10, wherein the predetermined thickness of the paste layer is 10 μm or more.

13. The method for manufacturing a component built-in module

according to claim 10, wherein the predetermined thickness of the paste layer is 100 μm or less.

14. The method for manufacturing a component built-in module
5 according to claim 10, wherein before conducting the step (iii), a part of a resin component of the conductive resin paste charged in the via hole is sucked through an opposite opening of the via hole.

15. The method for manufacturing a component built-in module
10 according to claim 10, wherein the step (iii) is conducted while sucking a part of a resin component of the conductive resin paste charged in the via hole through an opposite opening of the via hole.

16. The method for manufacturing a component built-in module
15 according to claim 10, wherein after conducting the step (ii) plural times, the step (iii) is conducted.

17. The method for manufacturing a component built-in module
according to claim 1,
20 wherein after attaching a protective film to a principal surface of the third electrical insulating sheet, the via hole is formed so as to penetrate through the protective film and the third electrical insulating sheet; and
the via hole is filled with the conductive resin paste by the steps of: (i)
disposing the conductive resin paste on a principal surface of the protective
25 film; (ii) applying the conductive resin paste over the principal surface of the protective film so that a paste layer made of the conductive resin paste with a predetermined thickness is formed around an opening of the via hole on the principal surface of the protective film, while filling the via hole with the
conductive resin paste; and (iii) scraping the paste layer off from the principal
30 surface of the protective film, while filling the via hole with the conductive

resin paste.

18. The method for manufacturing a component built-in module according to claim 17, wherein the paste layer is formed on the opening of the via hole and at a region within at least 300 μm from an edge of the opening.

19. The method for manufacturing a component built-in module according to claim 17, wherein the predetermined thickness of the paste layer is 10 μm or more.

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20. The method for manufacturing a component built-in module according to claim 17, wherein the predetermined thickness of the paste layer is 100 μm or less.

15 21. The method for manufacturing a component built-in module according to claim 17, wherein before conducting the step (iii), a part of a resin component of the conductive resin paste charged in the via hole is sucked through an opposite opening of the via hole.

20 22. The method for manufacturing a component built-in module according to claim 17, wherein the step (iii) is conducted while sucking a part of a resin component of the conductive resin paste charged in the via hole through an opposite opening of the via hole.

25 23. The method for manufacturing a component built-in module according to claim 17, wherein after conducting the step (ii) plural times, the step (iii) is conducted.

24. A component built-in module, comprising:
30 a first wiring pattern;

an electronic component mounted on the first wiring pattern;

a second wiring pattern;

an electrical insulating sheet with the electrical component built therein, the electrical insulating sheet being disposed between the first
5 wiring pattern and the second wiring pattern; and

a via conductor formed in a via hole penetrating through the electrical insulating sheet, the via conductor connecting electrically the first wiring pattern and the second wiring pattern,

wherein a side face of the via conductor defines a continuous line in
10 an axis direction of the via conductor.